



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,144	03/29/2004	Hee-joong Lee	Q74907	1114
23373	7590	11/25/2005		
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER BLACKMAN, ROCHELLE ANN J	
			ART UNIT 2851	PAPER NUMBER

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,144

Applicant(s)

LEE ET AL.

Examiner

Rochelle Blackman

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-12 and 14-17 is/are rejected.
- 7) ☒ Claim(s) 5 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-5 and 7-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claim 17 is objected to because of the following informalities: the claim recites the limitation "the second fly-eye lens array" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-4, 7, 12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimae et al. (U.S. Patent Application Publication No. 2003/0202259) in view of Lambert (U.S. Patent No. 6,288,815).

Regarding claims 1 and 7, Nishimae discloses a projection system (see FIGS. 1-36) comprising: a light source (for example, see 1 of FIG. 1A); a color separator (see 4 of FIG. 1A) which separates an incident beam according to color; a light valve (see 11

of FIG. 1A) which processes a beam transmitted by the color separator and the scrolling unit according to an image signal and which forms a color picture, the light valve comprising a plurality of micromirrors (see 16 of FIG. 1C) independently driven according to image signals to change a reflection angle of incident light and a projection lens unit (see 12 of FIG. 1A) which magnifies the color picture formed by the light valve and which projects the magnified color picture onto a screen; wherein the micromirrors are diagonally driven according to the image signals/ (claim 7) wherein the micromirrors are perpendicularly driven according to the image signals (see "*a rotation axis of each micro-mirror 16 is placed on a diagonal line of the micro-mirror 16 directed in the Y-axial direction*" in paragraph [0297] and see FIGS. 14C and 17C)

Regarding claim 2, Nishimae discloses a total internal reflection prism (see 10 of FIG. 1) disposed in front of the light valve, which directs light passed through the color separator...toward the light valve and which directs light reflected by the light valve toward the projection lens unit.

Regarding claim 3, Nishimae discloses wherein the total internal reflection prism comprises: a first prism (see prism adjacent to element 9 in FIG. 1A), having an incidence surface, a second prism (see prism adjacent to "projection lens" 10 in FIG. 1A), attached to the first prism at an interface and having an emission surface, and a total reflection surface (see surface between the "first and second prisms" in FIG. 1A), formed on the interface between the first and second prisms, for totally reflecting incident light at a predetermined angle.

Regarding claim 4, Nishimae discloses a reflection mirror (see 8 of FIG. 1A) disposed in front of the incidence surface of the first prism, which reflects light passed through the color separator...toward the incidence surface of the first prism.

Regarding claim 14, Nishimae discloses a spatial filter (see 31 of FIG. 16A and 16B) disposed between the light source and the scrolling unit, which controls a divergence angle of the light emitted from the light source.

Regarding claims 1, 7, 12, and 15, Nishimae does not appear to disclose "a scrolling unit, comprising at least one lens cell, which converts a rotation of the lens cell into the rectilinear motion of an area of the lens cell through which light passes so that an incident beam is scrolled; wherein the scrolling unit comprises a spiral lens disk on which at least one cylindrical lens cell is spirally arranged; and further comprising first and second cylindrical lenses respectively disposed in front of and behind the scrolling unit".

Lambert teaches providing a scrolling unit (see 20 of FIG. 3, 30 of FIG. 7A, 32 of FIG. 7B, and 40 of FIG. 7C), comprising at least one lens cell (see 24, 25 of FIG. 3; 31 of FIG. 7A; 33 of FIG. 7B; 41 of FIG. 7C; and 42, 43 of FIG. 7D), which converts a rotation of the lens cell into the rectilinear motion of an area of the lens cell through which light passes so that an incident beam is scrolled; wherein the scrolling unit comprises a spiral lens disk (see 33 of FIG. 7B) on which at least one cylindrical lens cell is spirally arranged; and further comprising first and second cylindrical lenses (see 22 and 23 of FIG. 3) respectively disposed in front of and behind the scrolling unit.

It would have been obvious to one ordinary skill in the art at the time the invention was made to provide the "projection system" of the Nishimae reference with a "scrolling unit" and "first and second cylindrical lenses in front and behind the scrolling unit", as taught by Lambert for the purpose of scroll multiple color bands across the "light valve" and sequentially illuminate all regions of the light valve, thus making efficient use of the "light valve", avoiding degradation of the resolution, and reducing scan non-linearities (see col. 1, lines 33-37 and col. 5, lines 27-34).

2. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimae et al. (U.S. Patent Application Publication No. 2003/0202259) in view of Lambert (U.S. Patent No. 6,288,815) as applied to claim 1 above, and further in view of Ouchi et al. (U.S. Patent Application Publication No. 2003/0169376).

Nishimae and Lambert disclose the claimed invention except for "wherein the color separator comprises first, second, and third dichroic filters, which are disposed in parallel between the light source and the scrolling unit and each of which reflects a beam of a color and transmits beams of all other colors; and further comprising a prism disposed in front of the color separator".

Ouchi teaches providing a color separator comprises first, second, and third dichroic filters (see 5a, 5b, and 5c of FIG. 11), which are disposed at different angles between the light source and the scrolling unit and each of which reflects a beam of a color and transmits beams of all other colors; a color separator comprises first, second, and third dichroic prisms (see 5 of FIG. 9) sequentially attached to one another between the light source and the scrolling unit, wherein the first, second, and third dichroic

prisms respectively include first, second, and third dichroic filters (see pg. 7, paragraph [0055], lines 7-12), each of which reflects a beam of a color and transmits beams of all other colors; a color separator comprises first, second, and third dichroic filters (see 5 of FIG. 9), which are disposed in parallel between the light source and the scrolling unit and each of which reflects a beam of a color and transmits beams of all other colors (see pg. 7, paragraph [0055], lines 7-12); and further comprising a prism (see first prism on right-hand side of 5 in FIG. 9) disposed in front of the color separator.

It would have been obvious to one ordinary skill in the art at the time the invention was made to provide the "projection system" of the combined Nishimae and Lambert reference with a "color separator" with salient features of Ouchi, in order to increase the utilization ratio of light and improve screen brightness, prevent increase in cost of the optical system and apparatus and to eliminate the need for adjustment of R, g, and B light projection spots (see pg. 1, paragraph [0004]).

3. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimae et al. (U.S. Patent Application Publication No. 2003/0202259) in view of Lambert (U.S. Patent No. 6,288,815) as applied to claim 1 above, and further in view of Bierhuzen et al. (U.S. Patent No. 6,839,095).

Nishimae and Lambert disclose the claimed invention including a relay lens (see 6 and 9 of FIG. 1A of Nishimae) disposed on a light path between light-intensity distribution uniformizing element 5 and "light valve" 11.

However, Nishimae and Lambert do not appear to disclose "a first and second fly-eye lens arrays sequentially disposed on a light path between the scrolling unit and

the light valve"; and the relay lens disposed on a light path "between the second fly-eye lens array and the light valve".

Bierhuizen discloses first and second fly-eye lens arrays (see 120 and 122 of FIGURE 7) sequentially disposed on a light path between the scrolling unit and the light valve; and a relay lens (see 128 of FIGURE 7) disposed on a light path between the second fly-eye lens array and the light valve.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the "projection system" of the combined Nishimae and Lambert reference with "first and second fly-eye lens arrays" and with the relay lens disposed "between the second fly-eye lens array and the light valve", as taught by Bierhuizen in order to increase light transmission efficiency and focus light toward the light valve.

Allowable Subject Matter

1. Claims 5 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
2. The following is a statement of reasons for the indication of allowable subject matter:

Claim 5 has been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the projection system comprising the particular feature of a reflection prism disposed in front of the incidence

surface of the first prism, which reflects light passed through the color separator and the scrolling unit toward the incidence surface of the first prism, in combination with the particular combination of features recited in claims 1-3.

Claim 13 has been found to be allowable because the prior art of record either alone or in combination neither discloses nor makes obvious the scrolling unit comprising a glass rod disposed between the first and second spiral lens disks, in combination with the particular combination of features recited in claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rochelle Blackman whose telephone number is (571) 272-2113. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571) 272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2851

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RB

William Perkey
Primary Examiner